

Incentives and Services for College Achievement:
Evidence from a Randomized Trial^{*}

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High dropout rates, delayed completion, and poor student achievement are growing concerns at many public colleges and universities. This paper reports findings from a randomized field experiment designed to improve university students' achievement, to increase completion rates, and reduce the time to graduation. The results reported here are for approximately 1600 first-year students at a large Canadian university. Students assigned to the Student Fellowship Program (SFP) were offered merit-scholarships for attaining a B average in first year while those assigned to the Student Support Program (SSP) were offered advising and tutorial services. A third treatment group combined both interventions. The demand for support services increased sharply when fellowships were also offered. Increased access to SSP services alone, however, appear to have had little effect on grades. On the other hand, the results show higher Fall grades in the SFP and SFP/SSP hybrid with no effects on the number or type of courses taken. Effects on grades at years-end were more modest. Fellowships affected grades for girls only, and were more likely to affect students who reported studying more in high school.

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Outline

I. Program Rationale and Structure

- Background and motivation for experiment
- Basic research design

II. Research Details and Preliminary Results

- Design details
- Results from Year-1

III. Discussion and Conclusions



Motivation

- Higher education may generate large economic and social gains
- In practice, many post-secondary students perform poorly, drop courses, or drop out entirely.
- Average 1st year dropout rate among public NA universities 15%
- Average 6-year non-completion rate among public NA universities 35%
- College enrolment increasing, but completion rate decreasing [Turner, 2004]
- Students may be equating costs and returns on the margin, but dropout/incomplete is usually seen as wasteful (perhaps because students don't account for sheepskin effects [Jaeger and Page, 1996], or b/c better grades means higher human capital accumulation [Pascarella and Smart, 1990])



Why Students Fail to Progress

- Lack of skills

- Weak academic (high school) background (e.g., Irvine, 1966)
- Problems integrating in a new social and academic environment also key (Tinto, 1993)

- Poor motivation

- Widely recognized problem in education [Goodlad, 2004]
- Motivated students are more likely to ask questions, pay attention in class, and persist w/schoolwork when they initially have trouble.



Common Support Services

- Academic advising (peer and professional)
- Orientation classes
- Content-based tutoring
- Supplemental instruction (meant to develop general skills like critical thinking and reasoning)
- Writing workshops

These efforts focus on skills.

\$1 billion annually on remedial services at public colleges
(Bettinger and Long, 2005)



Evidence on services

- Experimental evidence on support services in high school has been mixed (Dynarski and Gleason, 1998)
- A few credible observational studies suggest low-cost tutoring in high schools can work (e.g., Lavy and Schlosser, 2005)
- Bettinger and Long (2005) use an IV strategy to show some benefits of remedial instruction for under-prepared college students
- As far as we know, there have been no randomized evaluations of college support services



Merit-scholarships

- PSE includes a tradition of aid to very top performers (e.g., US National Merit; CMSF Excellence Awards)
- Recent years have seen the spread of programs to reward students with solid, though not necessarily exemplary academic records [Dynarski, 2004].
- For example, State tuition waivers for maintaining a 'B' average or better, e.g. Georgia Hope Scholarships
- Recent efforts also experiment with incentives in HS and grade school

These efforts focus on motivation



Evidence on Merit Awards in High School and College

College:

- Oosterbeek and Van der Klauw (2003) conclude offering \$1,000 incentive to pass all first year required classes at Univ. of Amsterdam increases grades among high ability students and decreases grades among low ability students (a small field experiment)
- Dynarski (2005) estimates Georgia Hope merit-aid increased college enrollment by 4 pct. points and completion by 2 pct. Points (state diff in diff design)
- Garibaldi et al. (2006) conclude raising tuition by €1,000 at admission decreases prob. of late graduation from 80% to 74% (regression discontinuity)

High School:

- Angrist and Lavy (2002) estimate merit award for passing high school matriculation exam boosts pass rate by 6-8 pct. Points (field experiment)
- Ashworth et al. (2002) [EMA] find offering stipends to at-risk high school students in UK to stay in school reduces dropout rates (matched comparison study)



The Student Achievement and Retention Project

- Field experiment to evaluate two programs designed to improve student achievement and retention
- The Student Support Program (SSP):
 - Peer advising
 - Supplemental Instruction (Facilitated Study Groups)
- The Student Fellowship Program (SFP):
 - Merit-scholarship for maintaining solid GPA in first year and enrolling in full-time second year studies



SSP Peer Advising

Advisors:

- Are trained/paid upperclassmen that offer academic counselling
- Communicate with advisees by email or in person
- Email advisees about every two weeks
- Encourage advisees to use campus-wide student services, attend tutorial sessions, and office hours
- Discuss questions about university assimilation, scheduling, studying, and time-management
- Scout other support issues, such as learning disabilities, academic advising, personal counselling and other issues



SSP Facilitated Study Groups (FSG)

- Voluntary course-focused sessions open to all students. A type of Supplemental Instruction (SI)
- Facilitated by trained upper year student who previously completed course (successfully), who also attends class and interacts with instructor
- Goal to foster critical thinking and reasoning skills, not meant to be content-based
- Used by hundreds of institutions and recognized by US Department of Education (Martin & Arendale, 1993)
- Multiple studies show grades 5 to 10 percentage pt. higher among SI attendees compared to non-attendees, with and without background controls (Arendale, 2005)

SFP Grade-Based Merit Awards

- \$1,000 - \$5,000 merit-scholarships for meeting GPA target in first year (and enrolling full-time in second year)
- Trade-off in choosing GPA target:
 - High GPA, less costly, few low skilled students able to qualify
 - Low GPA, more costly, more low skilled students able to qualify
- Solution: set grade targets conditional on high school grade quartiles (see next slide)
- \$5,000 targets set so that 5-10% expected to reach target; \$1,000 targets set so that 15-20% expected to reach target
\$2,500 intermediate target in a subset

SFP Award Schedule

Previous H.S. Grade average Quartile	(for only 1/2 in SFP)		
	\$1,000 for reaching a GPA of	\$2,500 for reaching a GPA of	\$5,000 for reaching a GPA of
0 – 25 th percentile	2.3 (C+)	2.7 (B-)	3.0 (B)
25 – 50 th percentile	2.7 (B-)	3.0 (B)	3.3 (B+)
50 th – 75 th percentile	3.0 (B)	3.3 (B+)	3.7 (A-)

The University of Toronto at Mississauga (UTM)

■ The UTM Population

- 77% commute from parent's home
- 76% plan to work at least part-time
- 42% plan to work more than 10 hours per week
- 25% picked UTM as first choice (53% picked main campus)
- 45% don't speak English at home
- 64% intend to obtain more than bachelors degree
- 83% intend to complete degree in 4 years

■ Retention and Achievement at UTM

- 12% year one dropout rate (11% at main campus)
- 29% 6-year non-completion rate (25% at main campus)
- 75th high school grade percentile at UTM = 25th percentile at main campus





Research Design and Implementation

- July 2005: background online and phone survey of all incoming first year students (90 % response).
- August: Population of incoming first year students identified and categorized by high school grade quartile; top quartile dropped
- Random assignment:
 - 250 randomly selected for SSP
 - 250 randomly selected for SFP
 - 150 selected for both (SFSP)
- Remaining (~1,000) selected as control group



LOGISTICS: Initial Contacts

- Program information package, including cover letter from University president (principal), sent in mid-August to selected program participants
- Eligibility requires a consent signature
- Originally required to personally return agreement to project office. 2 weeks after mailing, we added internet sign-up
- 4 follow-up emails to participants that had not returned agreement, and 1 set of attempted phone calls
- Consent rates by November 1st: 86% for SFSP, 75% for SFP, and 52% for SSP



Follow-up Contacts for Consenters: (SSP/SFSP)

- Advisors assigned
- Initial emails encourage first face-to-face meeting
- FSG times and locations announced initially each week
- Advisor-initiated contact approximately every 2 weeks (whether reply or not)
- Participant-initiated contact through email and at office
- Bookstore award “passport” program for any SSP/SFSP service contact



Follow-up Contacts for SFP and SFSP

- Fellowship reminder cards: Nov 25
- Relocation announcement: February 1
- Last reminder: Mar 29

Student Number: XXXXXXXXX

FIRST YEAR GPA TARGET	SECOND YEAR FELLOWSHIP
2.7 (B-)	\$1000
3.0 (B)	\$2500
3.3 (B+)	\$5000

Design Notes

- We cannot compel treatment, only offer services/incentives.
- In other words, we randomize opportunities, and students choose whether to use services or consent to SFP eligibility.
- This leads to two possible experimental designs:
 - Design I.** Solicit compliance; then randomly offer services to half of those who indicate a willingness to participate and interest in using services/incentives (ex post, some will not).
 - Design II.** Randomly divide the study sample in half; then offer services in one half only, treating anyone in this half who is willing to participate and interested in services/incentives.
- We use Design II.

Design Notes (cont.)

- In Design II, we can estimate same TOT parameter as Design I:
$$E[Y_{1i} - Y_{0i} | D_i=1] = \frac{\{E[Y_i | Z_i=1] - E[Y_i | Z_i=0]\}}{P[D_i=1 | Z_i=1]}$$

We compare those offered ($Z_i=1$) and not offered ($Z_i=0$) in the entire sample (ITT) and divide by the compliance rate.
- Two types of non-compliance account for the gap between the ITT and TOT:
 - SSP/SFP/SFSP: Failure to give consent
 - SSP/SFSP-only: Failure to use mentoring/FSG services (and for a small number, lack of available FSGs)
- For now, however, we focus on RFs b/c consent is high in SFP and RF is zero in SSP.



Why We Prefer Design II

- *Design I does not advertise collectively; it is not a GRT.*
- *Design I is more powerful than design II.*

But . . .

- **Design I** requires that some recruited subjects be denied services. This is unattractive to program operators.
- **Design II** allows us to focus participant recruiting efforts on subjects whom we are sure to treat. This is attractive to service providers and may offset power loss.
- **Design II** allows for unobtrusive data collection on controls
- **Design II** is a more realistic service-delivery model in that we allow full, voluntary take-up (though in practice, we might cluster offers)



Implementation and First-Stages

- Descriptive statistics by assignment: [Table 1](#) shows T and C are well-balanced
- More treatment/control balance: [High-school grade distribution by treatment status](#).
- Selection effects and random assignment: [Table 2](#).
 - No evidence of selection bias or composition effects
- First-stage effects on consent, survey response, and use of services: [Tables 3 and 3b](#).
 - Consent rates are higher in SFP and SFSP
 - Modest use of SI, similar to previous findings; higher when we adjust for consent
 - SSP use was higher for girls
 - Hard-workers also use services more ([Table 3c](#))



Effects on Fall Grades

- We look first at results on Fall grades. This reflects students' initial response to the program.
- The outcome here is the average grade in one-semester classes only: [Table 4](#).
 - Results show substantial effects of the SFP, and a clear distribution shift; see [Figures 1-2](#) for s.e. bands.
 - Little effect of SSP, though Fall service use was low
- Other important findings:
 - Effects come from girls, at $.25\sigma$ w/o adj. for compliance
 - More SFSP than SFP, an interaction effect?
 - More for hard-workers than bums, [Table 4b](#)



Full-year results

- The full-year results are for credit-weighted avg. grades and official GPA, a grade composite that determines subsequent enrollment.
- Initial SFP effects on grades remain positive for girls but have faded: [Table 5](#).
 - Some distribution shifts for SFP/SFSP girls remain, [Figures 3-4](#)
 - SSP remains zero, though take-up increased
- Some average effects for girls in two cuts ([Table 5b](#))
 - SFSP more than SFP
 - Hard-workers more than bums
- (Similar pattern of effects on GPA: [Table 6](#))



Eligibility for SFP Payments

- SFP and SFSP treated were eligible for 1000, 2500 (half), and 5000 payments
- We looked at eligibility in control as well as treatment
- Small effects on eligibility, but mixed. Some negative effects on boys: [Table 7](#).
- This is partly b/c the award standards turned out to be higher than we meant them to be
- Few got 5000, largely b/c achievement levels dropped sharply in the treatment year: [Table 7c](#).



Summary and Directions for Further Work

- SFP: big boost to Fall grades, entirely from girls. Little impact of services alone.
- Most of these SFP effects faded by years-end, though some remain for SFSP girls, and perhaps for hard-workers
- An apparent irony – those who need help least make the most of new opportunities, and get the most in return
- What we'd like to do next:
 - Another year at UTM, with adjustments to sample and standards
 - Another site with better students

Table 1: Descriptive Statistics

	Control Mean	Contrasts by treatment status				Obs	Sample
		SSP v. Control	SFP v. Control	SFSP v. Control	F-stat (all=control)		
<i>Administrative variables</i>							
Registered	0.965	0.019 [0.012]	0.019 [0.012]	-0.005 [0.015]	1.58 (0.193)	1656	STAR
Took survey	0.989	0.011 [0.008]	-0.009 [0.008]	-0.009 [0.009]	1.83 (0.139)	1656	STAR
Completed survey	0.888	-0.020 [0.023]	-0.012 [0.023]	-0.054 [0.029]	1.31 (0.271)	1656	STAR
Canada to analyze academic and income data	0.762	-0.014 [0.030]	-0.030 [0.030]	-0.002 [0.038]	0.37 (0.777)	1656	STAR
Has fall grades	0.844	-0.004 [0.026]	0.032 [0.026]	-0.051 [0.032]	1.63 (0.181)	1656	STAR
<i>Student background variables</i>							
Female	0.571	-0.003 [0.035]	0.029 [0.035]	-0.024 [0.043]	0.41 (0.749)	1656	STAR
High school GPA	78.7 {4.23}	0.175 [0.301]	0.148 [0.301]	-0.197 [0.373]	0.32 (0.812)	1656	STAR
Age	18.3 {0.628}	-0.012 [0.045]	-0.020 [0.045]	0.041 [0.055]	0.33 (0.805)	1656	STAR
<i>Survey response variables</i>							
Hrs/wk study in high school	17.7 {12.7}	-0.644 [0.921]	-0.425 [0.917]	-0.492 [1.162]	0.23 (0.879)	1454	Survey
UTM first uni. choice	0.244	0.009 [0.033]	0.062 [0.033]	0.036 [0.042]	1.29 (0.277)	1454	Survey
Parents very important in uni. decision	0.400	-0.008 [0.037]	-0.034 [0.037]	-0.024 [0.047]	0.34 (0.798)	1454	Survey

Figure 1
High School Grade Average Distribution among Project STAR Participants:
Control Group and SFP/SFSP Combined

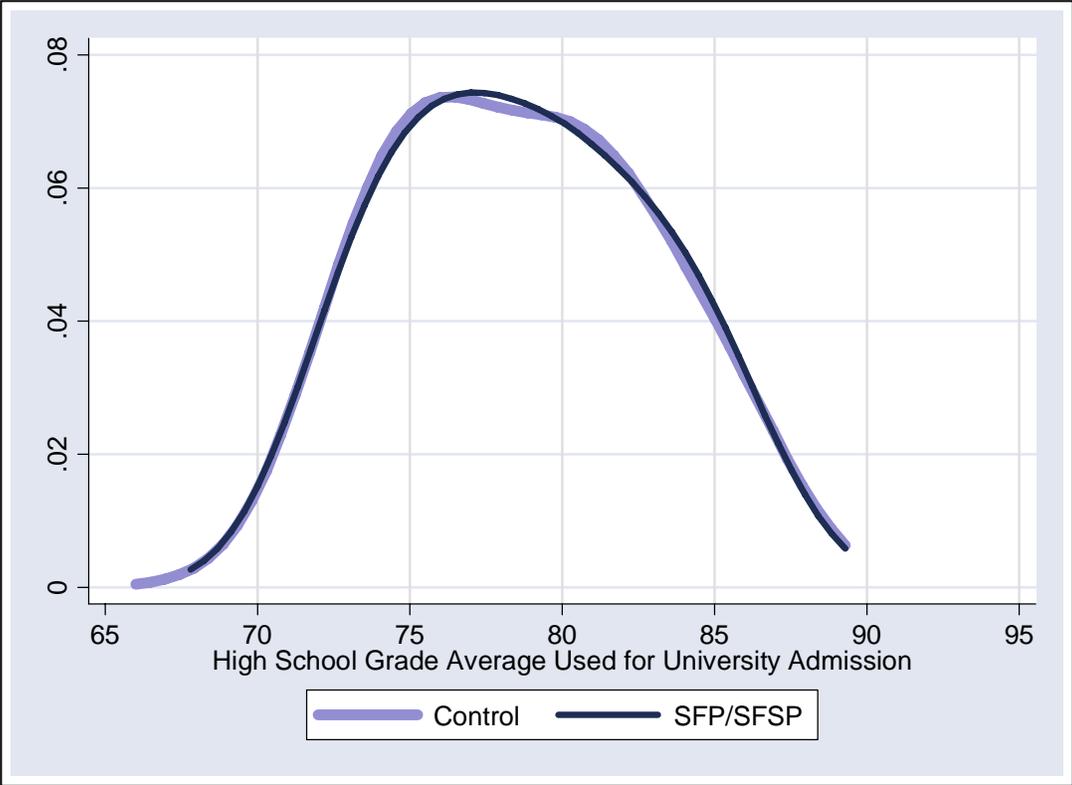


Figure 3
High School Grade Average Distribution Among Project STAR Participants:
Control Group and SSP

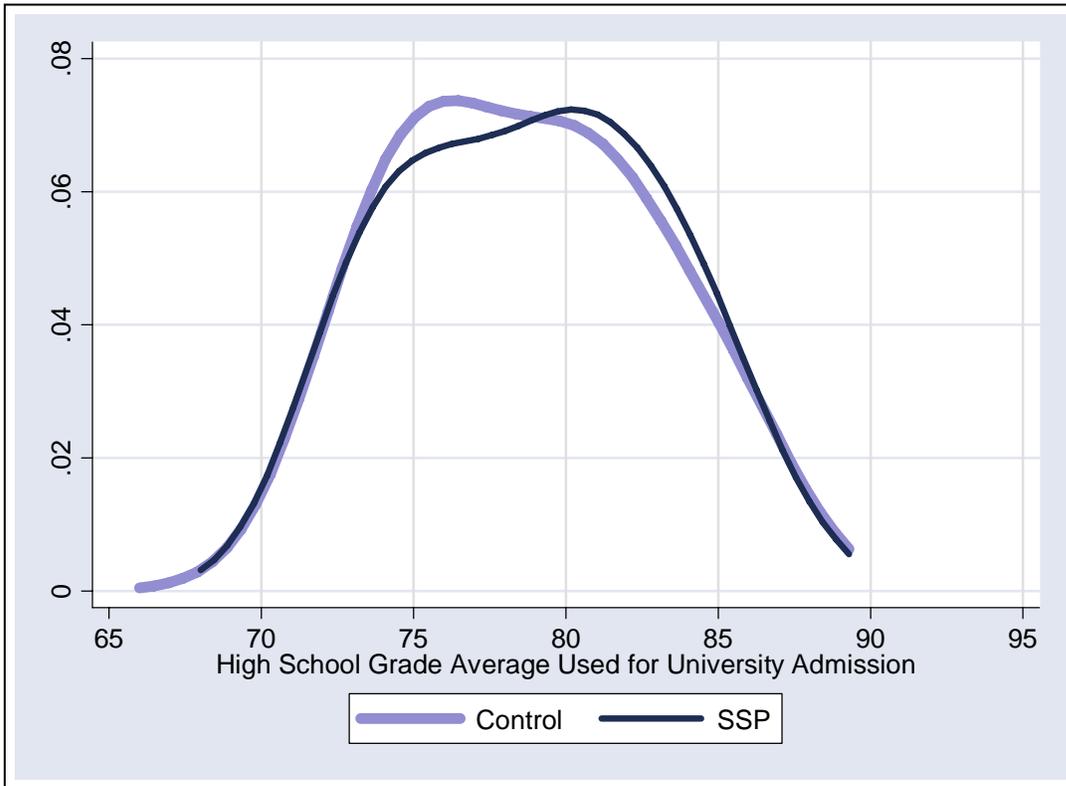


Table 2: Selection Effects

	Registered			Has grades			Gave permission to Stats Canada		
	No controls (1)	Basic controls (2)	All controls (3)	No controls (4)	Basic controls (5)	All controls (6)	No controls (7)	Basic controls (8)	All controls (9)
<i>Control group mean</i>		0.965 (0.183)			0.942 (0.233)			0.762 (0.426)	
Offered SSP	0.019 [0.010]	0.019 [0.010]	0.005 [0.009]	-0.006 [0.017]	-0.006 [0.017]	0.000 [0.015]	-0.014 [0.031]	-0.015 [0.031]	0.003 [0.027]
Offered SFP	0.019 [0.010]	0.018 [0.010]	0.019 [0.005]	0.026 [0.013]	0.025 [0.013]	0.028 [0.009]	-0.030 [0.031]	-0.030 [0.031]	-0.021 [0.028]
Offered SSP and SFP	-0.005 [0.017]	-0.005 [0.017]	-0.003 [0.015]	-0.029 [0.024]	-0.029 [0.024]	-0.01 [0.020]	-0.002 [0.037]	0.000 [0.038]	0.064 [0.029]
Observations	1656	1656	1454	1656	1656	1454	1656	1656	1454

Notes: Heteroskedasticity-robust standard errors in brackets. The row labelled control group mean reports the average outcome in the control group with the corresponding standard deviation in parentheses below.

Sample in columns (1), (2), (4), (5), (7) and (8) is all University of Toronto at Mississauga (UTM) students participating in the STAR program. Sample in columns (3), (6) and (9) is all STAR students who completed an online questionnaire. Sample in columns (10), (11), (16) and (17) is all STAR students matched to UTM grades data as of June, 2006. Sample in columns (12) and (18) is students matched to both grades and questionnaire data. Sample in columns (13) and (14) is those with at least one fall grade; sample in column (15) is those with at least one fall grade matched to questionnaire data. Basic controls include sex, mother tongue, and high school grade quartile. All controls add responses to 11 survey questions: Was UTM your first-choice university, How important were your parents in your decision to attend university, How sure are you about your career choice, How concerned are you about funding your studies, How many hours/week did you study in high school, How many hours/week do you plan to study at university, How many hours/week do you plan to work while in school, Do you often procrastinate, How important to you is attaining at least a B grade average, What are your mother's and father's education levels.

Table 2: Selection Effects (continued)

	Number of courses			Number of fall courses			Number of math and science courses		
	No controls (10)	Basic controls (11)	All controls (12)	No controls (13)	Basic controls (14)	All controls (15)	No controls (16)	Basic controls (17)	All controls (18)
<i>Control group mean</i>		3.95 (0.921)			1.64 (0.779)			2.20 (2.41)	
Offered SSP	0.061 [0.064]	0.055 [0.063]	0.033 [0.070]	0.047 [0.060]	0.043 [0.060]	0.038 [0.063]	0.16 [0.183]	0.156 [0.172]	0.177 [0.178]
Offered SFP	-0.011 [0.065]	-0.027 [0.063]	0.003 [0.063]	-0.131 [0.053]	-0.129 [0.053]	-0.098 [0.059]	0.206 [0.171]	0.202 [0.163]	0.222 [0.169]
Offered SSP and SFP	-0.088 [0.084]	-0.074 [0.082]	-0.033 [0.085]	0.072 [0.081]	0.062 [0.081]	0.067 [0.089]	-0.36 [0.208]	-0.285 [0.194]	-0.13 [0.218]
Observations	1561	1561	1403	1402	1402	1261	1561	1561	1403

Notes: Heteroskedasticity-robust standard errors in brackets. The row labelled control group mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below.

Sample in columns (1), (2), (4), (5), (7) and (8) is all University of Toronto at Mississauga (UTM) students participating in the STAR program. Sample in columns (3), (6) and (9) is all STAR students who completed an online questionnaire. Sample in columns (10), (11), (16) and (17) is all STAR students matched to UTM grades data as of June, 2006. Sample in columns (12) and (18) is students matched to both grades and questionnaire data. Sample in columns (13) and (14) is those with at least one fall grade; sample in column (15) is those with at least one fall grade matched to questionnaire data. Basic controls include sex, mother tongue, and high school grade quartile. All controls add responses to 11 survey questions: Was UTM your first-choice university, How important were your parents in your decision to attend university, How sure are you about your career choice, How concerned are you about funding your studies, How many hours/week did you study in high school, How many hours/week do you plan to study at university, How many hours/week do you plan to work while in school, Do you often procrastinate, How important to you is attaining at least a B grade average, What are your mother's and father's education levels.

Table 3: First-stage Effects

	Responded to STAR Invitation			Completed background questionnaire		Received SSP Services		
	No controls	Basic controls	All controls	No controls	Basic controls	No controls	Basic controls	All controls
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Control group mean</i>	-0-	-0-	-0-	0.900		-0-	-0-	-0-
Offered SSP	0.500 [0.020]***	0.500 [0.019]***	0.549 [0.020]***	-0.030 [0.022]	-0.031 [0.022]	0.228 [0.016]***	0.228 [0.016]***	0.253 [0.017]***
Offered SFP	0.858 [0.020]***	0.856 [0.019]***	0.869 [0.020]***	-0.010 [0.022]	-0.011 [0.022]	-0-	-0-	-0-
Offered SSP and SFP	0.729 [0.024]***	0.731 [0.024]***	0.785 [0.026]***	-0.053 [0.028]*	-0.053 [0.028]*	0.389 [0.020]***	0.390 [0.020]***	0.411 [0.022]***
Observations	1607	1607	1429	1607	1607	1607	1607	1429

Notes: Standard errors in brackets. Sample in all columns except (3) and (8) is all University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one grade as of June, 2006. Sample in columns (3) and (8) is STAR students with at least one grade who completed an online questionnaire. Basic controls include sex, mother tongue, and high school grade quartile. All controls add responses to 11 survey questions: Was UTM your first-choice university, How important were your parents in your decision to attend university, How sure are you about your career choice, How concerned are you about funding your studies, How many hours/week did you study in high school, How many hours/week do you plan to study at university, How many hours/week do you plan to work while in school, Do you often procrastinate, How important to you is attaining at least a B grade average, What are your mother's and father's education levels.

Table 3b: SSP Take-up by Service and Group

First-stage variable	Received SSP Services		Met with/emailed an Advisor		Attended FSGs	
	Basic controls	All controls	Basic controls	All controls	Basic controls	All controls
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Full sample						
Offered SSP	0.228 [0.027]	0.253 [0.030]	0.195 [0.025]	0.215 [0.028]	0.102 [0.019]	0.117 [0.022]
Offered SSP and SFP	0.390 [0.040]	0.411 [0.044]	0.361 [0.040]	0.377 [0.043]	0.126 [0.028]	0.133 [0.031]
Observations	1607	1429	1607	1429	1607	1429
Panel B: Male sample						
Offered SSP	0.190 [0.038]	0.204 [0.042]	0.143 [0.034]	0.149 [0.037]	0.094 [0.028]	0.108 [0.032]
Offered SSP and SFP	0.264 [0.055]	0.276 [0.064]	0.248 [0.054]	0.259 [0.061]	0.109 [0.040]	0.114 [0.046]
Observations	683	602	683	602	683	602
Panel C: Female sample						
Offered SSP	0.257 [0.037]	0.291 [0.041]	0.236 [0.036]	0.267 [0.040]	0.107 [0.026]	0.123 [0.029]
Offered SSP and SFP	0.489 [0.056]	0.509 [0.059]	0.450 [0.056]	0.464 [0.059]	0.140 [0.039]	0.144 [0.041]
Observations	924	827	924	827	924	827

Notes: Heteroscedasticity-robust standard errors in brackets, p-values in parentheses. Sample in all columns except (3), (6) and (9) is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one grade as of June, 2006. Sample in columns (3), (6) and (9) is enrolled STAR students with at least one grade who completed an online questionnaire. Basic controls include sex, mother tongue, and high school grade quartile. All controls add responses to 11 survey questions: Was UTM your first-choice university, How important were your parents in your decision to attend university, How sure are you about your career choice, How concerned are you about funding your studies, How many hours/week did you study in high school, How many hours/week do you plan to study at university, How many hours/week do you plan to work while in school, Do you often procrastinate, How important to you is attaining at least a B grade average, What are your mother's and father's education levels.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 3c: SSP Service Take-up, by hours per week spent on course work in last year of high school

First-stage variable	Received SSP Services			Met with/emailed an Advisor			Attended FSGs		
	All students (1)	≥median hrs (2)	<median hrs (3)	All students (4)	≥median hrs (5)	<median hrs (6)	All students (7)	≥median hrs (8)	<median hrs (9)
Panel A: Full sample									
Offered SSP	0.259 [0.030]	0.293 [0.043]	0.218 [0.042]	0.220 [0.029]	0.257 [0.041]	0.178 [0.039]	0.120 [0.022]	0.125 [0.031]	0.114 [0.032]
Offered SSP and SFP	0.420 [0.045]	0.500 [0.068]	0.349 [0.059]	0.386 [0.044]	0.425 [0.067]	0.350 [0.059]	0.136 [0.031]	0.170 [0.051]	0.105 [0.038]
Observations	1403	740	663	1403	740	663	1403	740	663
Panel B: Male sample									
Offered SSP	0.211 [0.043]	0.276 [0.065]	0.140 [0.053]	0.156 [0.039]	0.253 [0.064]	0.047 [0.034]	0.110 [0.033]	0.106 [0.045]	0.115 [0.048]
Offered SSP and SFP	0.277 [0.063]	0.288 [0.094]	0.263 [0.086]	0.257 [0.061]	0.247 [0.089]	0.264 [0.086]	0.119 [0.047]	0.165 [0.078]	0.072 [0.051]
Observations	589	311	278	589	311	278	589	311	278
Panel C: Female sample									
Offered SSP	0.294 [0.042]	0.263 [0.057]	0.328 [0.062]	0.269 [0.041]	0.213 [0.053]	0.328 [0.062]	0.126 [0.030]	0.117 [0.041]	0.139 [0.046]
Offered SSP and SFP	0.523 [0.061]	0.659 [0.085]	0.407 [0.082]	0.479 [0.060]	0.560 [0.089]	0.407 [0.082]	0.148 [0.043]	0.196 [0.069]	0.113 [0.052]
Observations	814	410	404	814	410	404	814	410	404

Notes: Heteroscedasticity-robust standard errors in brackets, p-values in parentheses. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one grade as of June, 2006 who completed an online questionnaire. Regressions include controls for sex, mother tongue, and high school grade quartile. Median hours are 15/wk for full sample, 17/wk for girls and 12/wk for boys.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4a: Treatment Effect on Fall Term Grade

Program	Pooled			By type		
	No controls (1)	Basic (2)	All (3)	No controls (4)	Basic (5)	All (6)
Panel A: All Students						
<i>Control mean</i>				63.8 (12.1)		
SSP	0.370 [0.964]	0.137 [0.933]	0.216 [0.978]	0.370 [0.964]	0.137 [0.933]	0.215 [0.979]
SFP (Any)	1.920 [0.751]**	1.774 [0.731]**	1.927 [0.776]**			
SFP				2.013 [0.860]**	1.811 [0.840]**	1.820 [0.872]**
SFSP				1.748 [1.190]	1.704 [1.162]	2.126 [1.244]*
Observations	1397	1397	1256	1397	1397	1256
Panel B: Male Students						
<i>Control mean</i>				65.1 (11.9)		
SSP	-0.406 [1.510]	-0.583 [1.491]	-0.301 [1.454]	-0.406 [1.512]	-0.583 [1.492]	-0.304 [1.455]
SFP (Any)	0.437 [1.126]	0.023 [1.093]	0.911 [1.129]			
SFP				0.817 [1.286]	0.496 [1.254]	1.164 [1.227]
SFSP				-0.196 [1.771]	-0.765 [1.741]	0.459 [1.877]
Observations	602	602	538	602	602	538
Panel C: Female Students						
<i>Control mean</i>				62.8 (12.1)		
SSP	0.944 [1.239]	0.789 [1.187]	1.006 [1.339]	0.944 [1.240]	0.788 [1.188]	1.004 [1.340]
SFP (Any)	3.055 [1.004]***	2.950 [0.975]***	2.681 [1.088]**			
SFP				2.961 [1.147]**	2.669 [1.124]**	2.515 [1.247]**
SFSP				3.241 [1.604]**	3.505 [1.536]**	3.002 [1.670]*
Observations	795	795	718	795	795	718

Notes: Heteroskedasticity-robust standard errors in brackets, non-robust standard errors in parentheses. The row labelled control mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one fall grade as of May, 2006 who completed an online questionnaire. Basic controls include high school grade quartile and mother tongue. All controls add responses to 11 survey questions: Was UTM your first-choice university, How important were your parents in your decision to attend university, How sure are you about your career choice, How concerned are you about funding your studies, How many hours/week did you study in high school, How many hours/week do you plan to study at university, How many hours/week do you plan to work while in school, Do you often procrastinate, How important to you is attaining at least a B grade average, What are your mother's and father's education levels. Panel A "Basic" and "All" regressions also control for sex.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 4b: Treatment Effect on Fall Grade, by hrs/week spent on course work in last year of high school

Program	Pooled			By type		
	Full sample (1)	≥median hrs (2)	<median hrs (3)	Full sample (4)	≥median hrs (5)	<median hrs (6)
Panel A: All Students						
<i>Control mean</i>	63.9 (12.3)	63.1 (12.4)	64.9 (12.1)	63.9 (12.3)	63.1 (12.4)	64.9 (12.1)
SSP	0.232 [0.964]	1.011 [1.288]	-0.675 [1.467]	0.232 [0.965]	1.005 [1.289]	-0.678 [1.468]
SFP (Any)	1.894 [0.760]**	2.633 [1.082]**	1.027 [1.062]			
SFP				1.744 [0.857]**	1.753 [1.199]	1.671 [1.203]
SFSP				2.176 [1.233]*	4.650 [1.888]**	0.032 [1.623]
Observations	1256	664	592	1256	664	592
Panel B: Male Students						
<i>Control mean</i>	65.3 (12.2)	64.9 (12.2)	65.8 (12.1)	65.3 (12.2)	64.9 (12.2)	65.8 (12.1)
SSP	-0.436 [1.453]	0.606 [1.960]	-1.838 [2.160]	-0.435 [1.454]	0.624 [1.968]	-1.835 [2.166]
SFP (Any)	0.803 [1.085]	1.682 [1.614]	-0.270 [1.445]			
SFP				1.031 [1.163] (1.437)	3.168 [1.721]* (2.094)	-1.095 [1.567] (1.993)
SFSP				0.399 [1.848] (1.833)	-1.007 [2.844] (2.715)	1.143 [2.342] (2.495)
Observations	538	284	254	538	284	254
Panel C: Female Students						
<i>Control mean</i>	62.8 (12.2)	63.1 (12.9)	62.6 (11.4)	62.8 (12.2)	63.1 (12.9)	62.6 (11.4)
SSP	0.870 [1.293]	0.141 [1.646]	1.431 [2.000]	0.869 [1.294]	0.123 [1.650]	1.426 [2.005]
SFP (Any)	2.539 [1.044]**	1.868 [1.404]	3.038 [1.553]*			
SFP				2.165 [1.202]* (1.220)*	-0.407 [1.602] (1.707)	4.512 [1.745]** (1.747)**
SFSP				3.271 [1.638]** (1.614)**	6.824 [1.930]** (2.383)**	0.395 [2.464] (2.212)
Observations	718	366	352	718	366	352

Notes: Heteroskedasticity-robust standard errors in brackets, non-robust standard errors in parentheses for columns 4-6. The row labelled control mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one fall grade as of May, 2006 who completed an online questionnaire. All regressions include controls for high school grade quartile and mother tongue; Panel A controls for sex. Median hours are 15/wk for full sample, 17/wk for girls and 12/wk for boys.

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1
Treatment effects by fall grade cutoff, SSP and any SFP treatments
(Dashed lines are 90% confidence bands.)

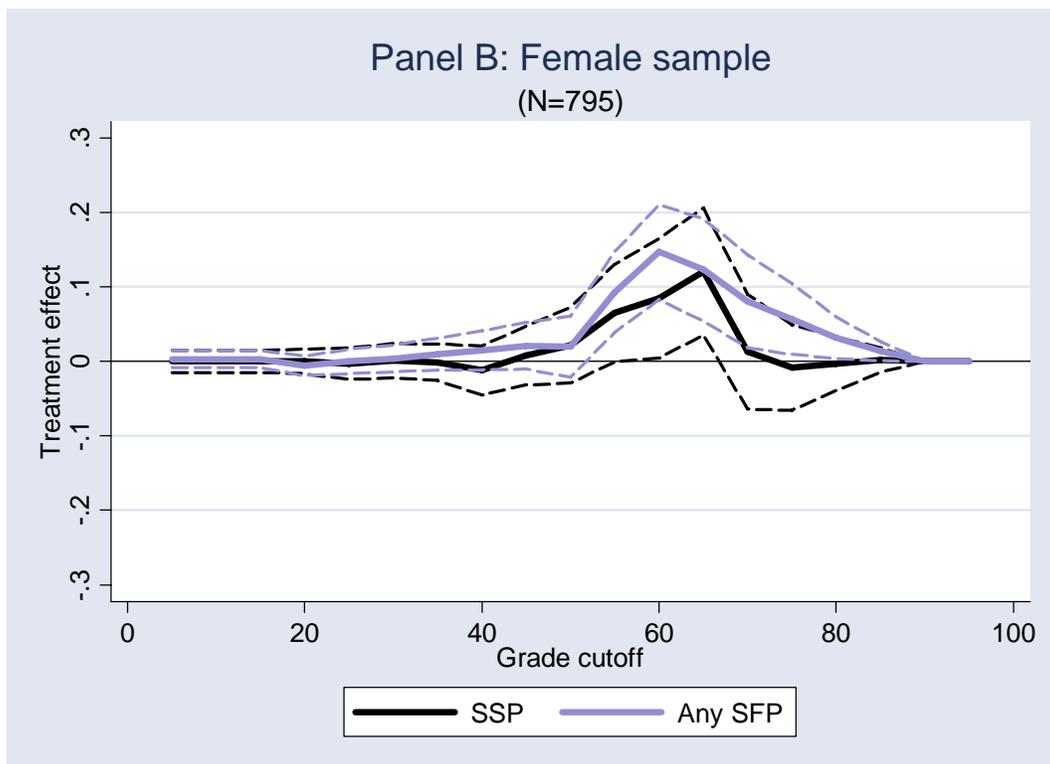
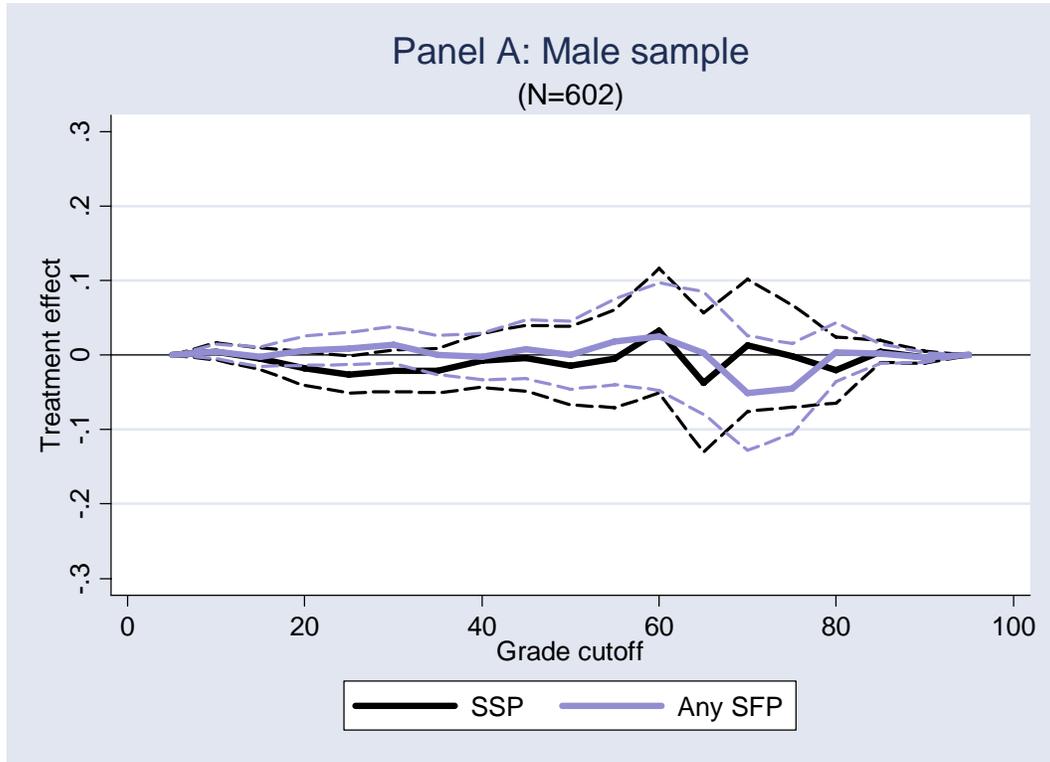


Figure 2
Treatment effects by fall grade cutoff, SFP and SFSP treatments
(Dashed lines are 90% confidence bands.)

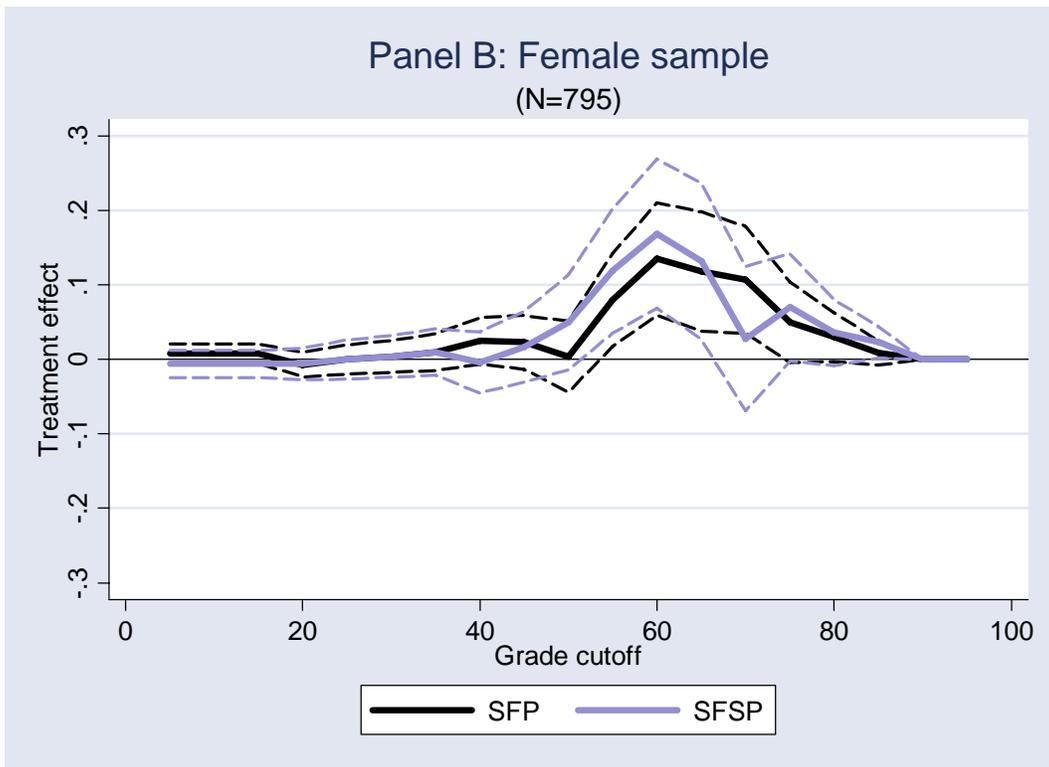
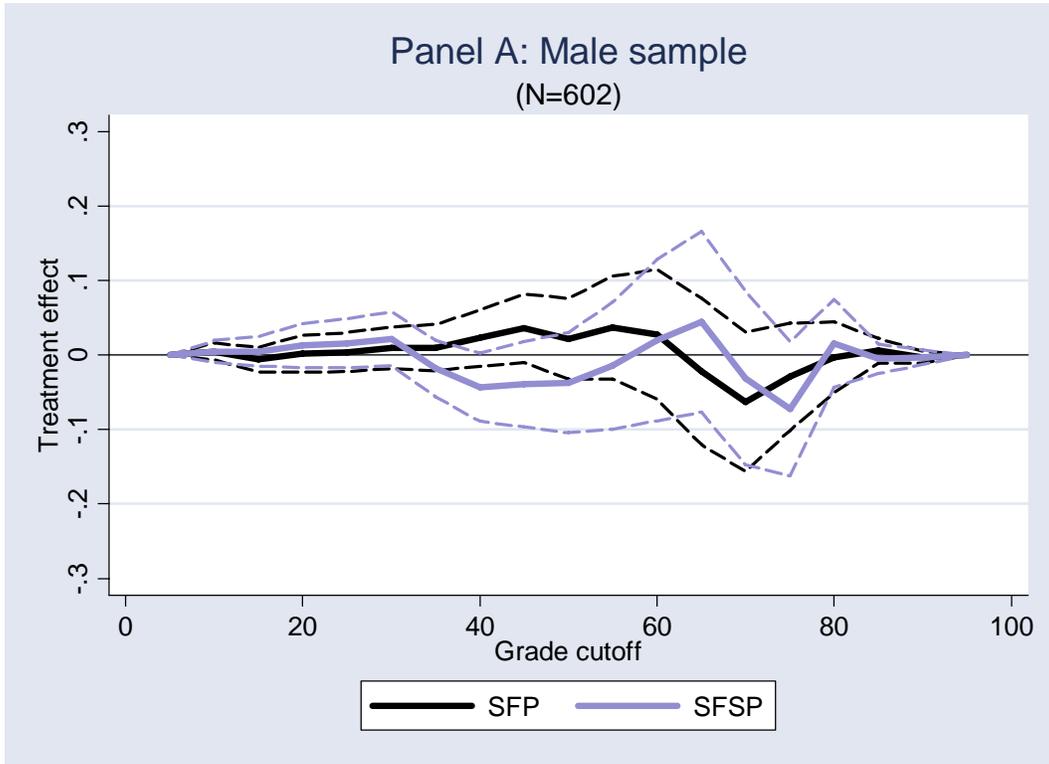


Table 5a: Treatment Effect on First-year Grade (Credit-weighted)

Program	Pooled			By type		
	No controls (1)	Basic (2)	All (3)	No controls (4)	Basic (5)	All (6)
Panel A: All Students						
<i>Control mean</i>				60.1 (12.9)		
SSP	-0.746 [1.027]	-0.889 [0.951]	-0.467 [0.972]	-0.746 [1.028]	-0.889 [0.952]	-0.469 [0.972]
SFP (Any)	0.510 [0.756]	0.429 [0.714]	0.253 [0.774]			
SFP				0.322 [0.841]	0.096 [0.790]	-0.370 [0.859]
SFSP				0.842 [1.245]	1.02 [1.198]	1.39 [1.295]
Observations	1561	1561	1403	1561	1561	1403
Panel B: Male Students						
<i>Control mean</i>				60.8 (13.2)		
SSP	-0.928 [1.664]	-1.29 [1.592]	-0.901 [1.528]	-0.928 [1.665]	-1.29 [1.593]	-0.897 [1.530]
SFP (Any)	-0.526 [1.185]	-0.781 [1.128]	-0.925 [1.254]			
SFP				-1.12 [1.338]	-1.19 [1.280]	-1.66 [1.425]
SFSP				0.423 [1.874]	-0.123 [1.805]	0.348 [2.035]
Observations	661	661	589	661	661	589
Panel C: Female Students						
<i>Control mean</i>				59.7 (12.7)		
SSP	-0.618 [1.294]	-0.563 [1.164]	0.331 [1.259]	-0.618 [1.295]	-0.563 [1.165]	0.327 [1.260]
SFP (Any)	1.26 [0.983]	1.29 [0.924]	1.23 [1.013]			
SFP				1.32 [1.080]	0.970 [1.005]	0.815 [1.113]
SFSP				1.146 [1.669]	1.889 [1.607]	2.011 [1.705]
Observations	900	900	814	900	900	814

Notes: Heteroskedasticity-robust standard errors in brackets, non-robust standard errors in parentheses. The row labelled control mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one grade as of May, 2006 who completed an online questionnaire. Basic controls include high school grade quartile and mother tongue. All controls add responses to 11 survey questions: Was UTM your first-choice university, How important were your parents in your decision to attend university, How sure are you about your career choice, How concerned are you about funding your studies, How many hours/week did you study in high school, How many hours/week do you plan to study at university, How many hours/week do you plan to work while in school, Do you often procrastinate, How important to you is attaining at least a B grade average, What are your mother's and father's education levels. Panel A "Basic" and "All" regressions also control for sex.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5b: Treatment Effect on First-year Grade, by hours per week spent on course work in last year of high school

Program	Pooled			By type		
	Full sample (1)	≥median hrs (2)	<median hrs (3)	Full sample (4)	≥median hrs (5)	<median hrs (6)
Panel A: All Students						
<i>Control mean</i>	60.4 (12.7)	60.2 (12.9)	60.5 (12.6)	60.4 (12.7)	60.2 (12.9)	60.5 (12.6)
SSP	-0.466 [0.961]	-1.181 [1.263]	0.479 [1.458]	-0.466 [0.961]	-1.184 [1.263]	0.477 [1.459]
SFP (Any)	0.175 [0.762]	1.163 [1.032]	-0.765 [1.129]			
SFP				-0.362 [0.839]	-0.376 [1.169]	-0.393 [1.215]
SFSP				1.157 [1.298]	4.407 [1.653]***	-1.358 [1.912]
Observations	1403	740	663	1403	740	663
Panel B: Male Students						
<i>Control mean</i>	61.2 (12.8)	60.9 (13.5)	61.6 (12.1)	61.2 (12.8)	60.9 (13.5)	61.6 (12.1)
SSP	-1.031 [1.554]	-1.825 [2.138]	-0.287 [2.226]	-1.033 [1.555]	-1.821 [2.143]	-0.277 [2.232]
SFP (Any)	-0.989 [1.216]	-0.763 [1.917]	-1.398 [1.517]			
SFP				-1.711 [1.364] (1.457)	-0.517 [2.213] (2.184)	-3.090 [1.680]* (1.932)
SFSP				0.259 [2.021] (1.836)	-1.199 [3.260] (2.792)	1.428 [2.477] (2.393)
Observations	589	311	278	589	311	278
Panel C: Female Students						
<i>Control mean</i>	59.7 (12.6)	60.8 (12.1)	58.5 (13.1)	59.7 (12.6)	60.8 (12.1)	58.5 (13.1)
SSP	0.002 [1.212]	-0.830 [1.514]	0.928 [1.872]	0.002 [1.212]	-0.830 [1.513]	0.922 [1.875]
SFP (Any)	0.974 [0.980]	0.982 [1.235]	0.975 [1.539]			
SFP				0.525 [1.066] (1.150)	-1.834 [1.389] (1.512)	2.447 [1.602] (1.717)
SFSP				1.829 [1.708] (1.506)	6.338 [1.739]*** (1.994)***	-1.835 [2.722] (2.236)
Observations	814	410	404	814	410	404

Notes: Heteroskedasticity-robust standard errors in brackets, non-robust standard errors in parentheses for columns 4-6. The row labelled control mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one fall grade as of May, 2006 who completed an online questionnaire. All regressions include controls for high school grade quartile and mother tongue; Panel A controls for sex. Median hours are 15/wk for full sample, 17/wk for girls and 12/wk for boys.

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 3
Treatment effects by first year grade cutoff, SSP and any SFP treatments
(Dashed lines are 90% confidence bands.)

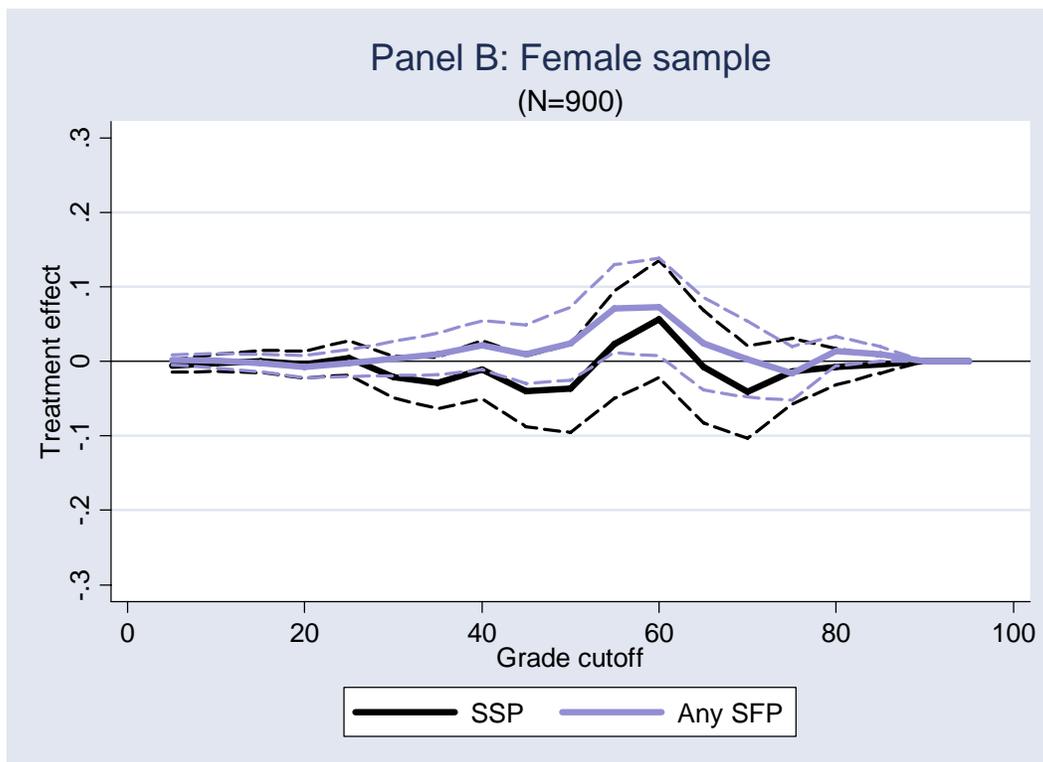
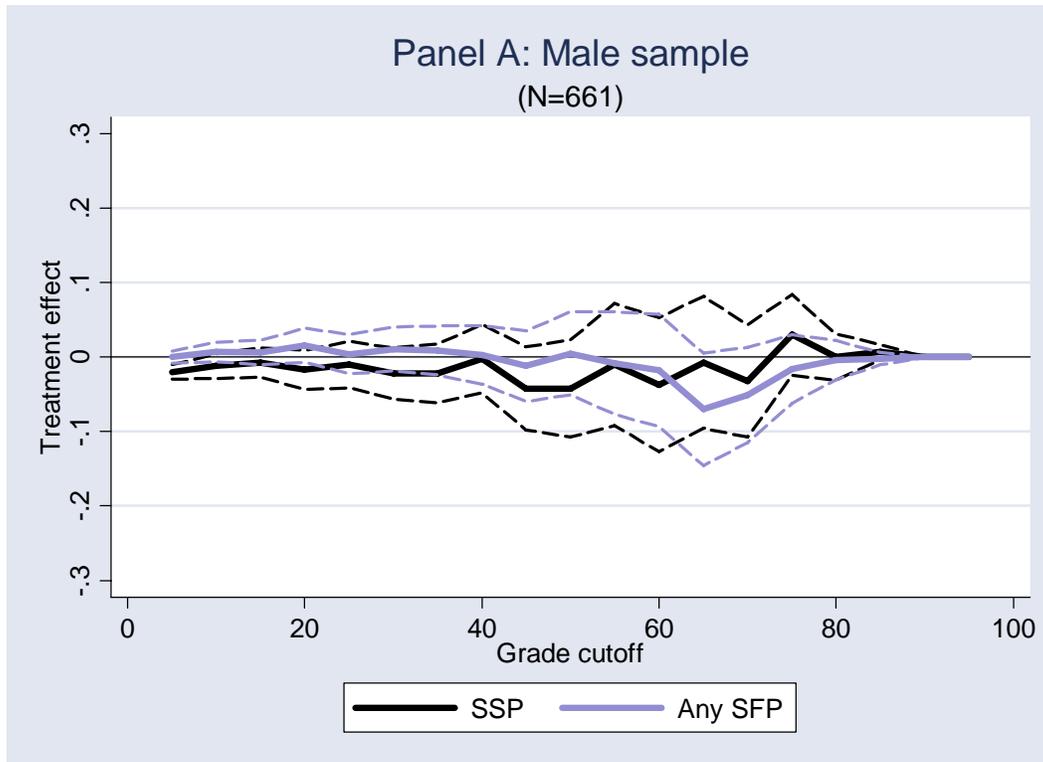


Figure 4
Treatment effects by first year grade cutoff, SFP and SFSP treatments
(Dashed lines are 90% confidence bands.)

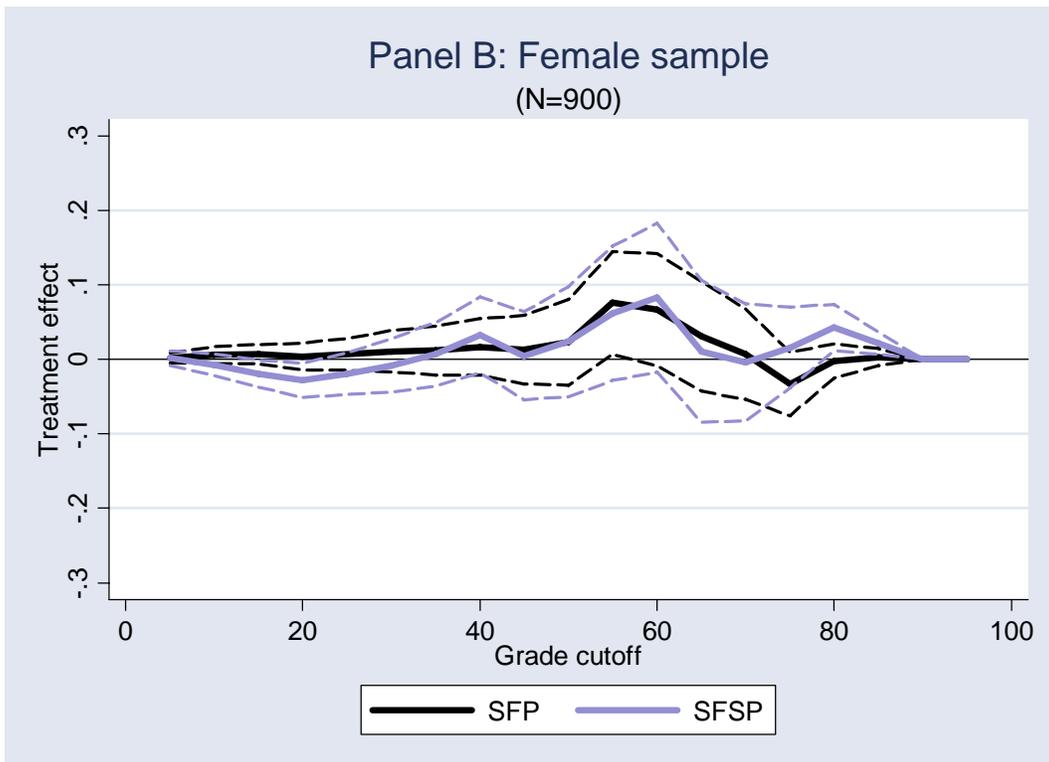
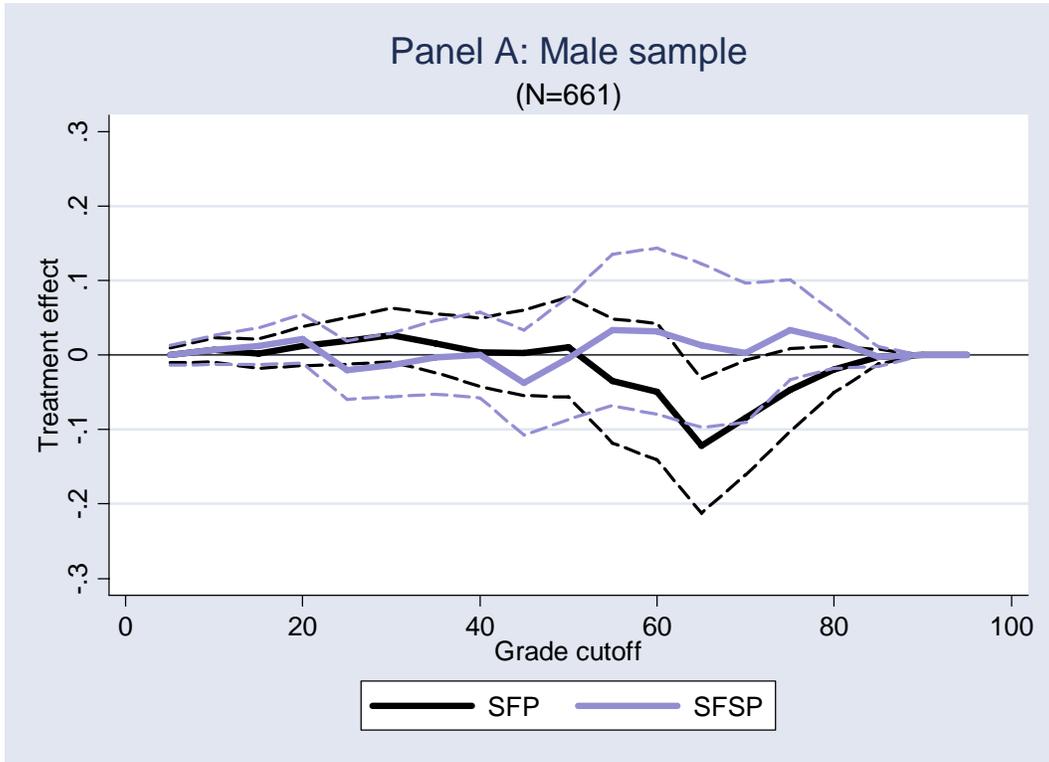


Table 7a: Treatment Effect on Eligibility for \$1000 Fellowship, by hours per week spent on course work in last year of high school

Program	Pooled			By type		
	Full sample (1)	≥median hrs (2)	<median hrs (3)	Full sample (4)	≥median hrs (5)	<median hrs (6)
Panel A: All Students						
<i>Control mean</i>	0.161 (0.368)	0.161 (0.368)	0.160 (0.367)	0.161 (0.368)	0.161 (0.368)	0.160 (0.367)
SSP	0.000 [0.028]	-0.019 [0.036]	0.019 [0.044]	0.000 [0.028]	-0.019 [0.036]	0.019 [0.044]
SFP (Any)	0.013 [0.024]	0.040 [0.035]	-0.016 [0.034]			
SFP				-0.006 [0.028]	0.004 [0.040]	-0.020 [0.039]
SFSP				0.047 [0.039]	0.114 [0.061]*	-0.010 [0.051]
Observations	1403	740	663	1403	740	663
Panel B: Male Students						
<i>Control mean</i>	0.196 (0.397)	0.209 (0.408)	0.180 (0.385)	0.196 (0.397)	0.209 (0.408)	0.180 (0.385)
SSP	-0.037 [0.043]	-0.097 [0.054]*	0.026 [0.068]	-0.037 [0.043]	-0.097 [0.054]*	0.027 [0.068]
SFP (Any)	-0.046 [0.037]	0.006 [0.058]	-0.095 [0.046]**			
SFP				-0.076 [0.041]* (0.045)*	-0.012 [0.067] (0.066)	-0.138 [0.046]*** (0.062)**
SFSP				0.006 [0.061] (0.057)	0.038 [0.096] (0.085)	-0.024 [0.077] (0.077)
Observations	589	311	278	589	311	278
Panel C: Female Students						
<i>Control mean</i>	0.135 (0.342)	0.145 (0.352)	0.126 (0.332)	0.135 (0.342)	0.145 (0.352)	0.126 (0.332)
SSP	0.026 [0.036]	0.020 [0.052]	0.028 [0.052]	0.026 [0.037]	0.020 [0.052]	0.028 [0.052]
SFP (Any)	0.055 [0.032]*	0.016 [0.044]	0.084 [0.047]*			
SFP				0.043 [0.038] (0.035)	-0.044 [0.049] (0.051)	0.112 [0.056]** (0.049)**
SFSP				0.077 [0.051] (0.046)*	0.129 [0.078]* (0.067)*	0.029 [0.069] (0.063)
Observations	814	410	404	814	410	404

Notes: Heteroskedasticity-robust standard errors in brackets, non-robust standard errors in parentheses for columns 4-6. The row labelled control mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one fall grade as of May, 2006 who completed an online questionnaire. All regressions include controls for high school grade quartile and mother tongue; Panel A controls for sex. Median hours are 15/wk for full sample, 17/wk for girls and 12/wk for boys.

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 7c: Treatment Effect on Eligibility for \$5000 Fellowship, by hours per week spent on course work in last year of high school

Program	Pooled			By type		
	Full sample (1)	≥median hrs (2)	<median hrs (3)	Full sample (4)	≥median hrs (5)	<median hrs (6)
Panel A: All Students						
<i>Control mean</i>	0.035 (0.184)	0.026 (0.160)	0.045 (0.208)	0.035 (0.184)	0.026 (0.160)	0.045 (0.208)
SSP	-0.007 [0.013]	0.001 [0.017]	-0.016 [0.020]	-0.007 [0.013]	0.001 [0.017]	-0.016 [0.021]
SFP (Any)	0.013 [0.013]	0.023 [0.018]	0.002 [0.020]			
SFP				-0.003 [0.014]	-0.009 [0.015]	0.003 [0.024]
SFSP				0.042 [0.025]*	0.090 [0.043]**	0.002 [0.029]
Observations	1403	740	663	1403	740	663
Panel B: Male Students						
<i>Control mean</i>	0.044 (0.206)	0.036 (0.186)	0.054 (0.226)	0.044 (0.206)	0.036 (0.186)	0.054 (0.226)
SSP	-0.003 [0.024]	0.003 [0.032]	-0.01 [0.036]	-0.003 [0.024]	0.003 [0.032]	-0.01 [0.036]
SFP (Any)	-0.007 [0.020]	-0.005 [0.026]	-0.010 [0.031]			
SFP				-0.020 [0.020] (0.024)	-0.010 [0.029] (0.031)	-0.032 [0.030] (0.038)
SFSP				0.016 [0.035] (0.030)	0.005 [0.042] (0.040)	0.025 [0.055] (0.047)
Observations	589	311	278	589	311	278
Panel C: Female Students						
<i>Control mean</i>	0.028 (0.166)	0.027 (0.163)	0.029 (0.169)	0.028 (0.166)	0.027 (0.163)	0.029 (0.169)
SSP	-0.011 [0.014]	-0.010 [0.019]	-0.013 [0.020]	-0.011 [0.014]	-0.010 [0.019]	-0.013 [0.020]
SFP (Any)	0.027 [0.018]	0.027 [0.026]	0.027 [0.025]			
SFP				0.009 [0.018] (0.018)	-0.014 [0.019] (0.025)	0.029 [0.030] (0.025)
SFSP				0.061 [0.035]* (0.023)***	0.104 [0.061]* (0.033)***	0.023 [0.039] (0.033)
Observations	814	410	404	814	410	404

Notes: Heteroskedasticity-robust standard errors in brackets, non-robust standard errors in parentheses in columns 4-6. The row labelled control mean reports the average outcome in the control group, with the corresponding standard deviation in parentheses below. Sample is all enrolled University of Toronto at Mississauga (UTM) students participating in the STAR program with at least one fall grade as of May, 2006 who completed an online questionnaire. All regressions include controls for high school grade quartile and mother tongue; Panel A controls for sex. Median hours are 15/wk for full sample, 17/wk for girls and 12/wk for boys.